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Global Skiing Trends – Will the Dendrite Generator Help?

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The Climate System Problem Context

- Climate change is proceeding
  - Warmest winter was in 2007/08 on Northern Hemisphere
  - Regardless the altitude range, all skiing areas were affected

- Climate Adaptation in Austria and Other Winter Tourism Countries
  - Practiced widely since 25 years
  - More efficient, new transportation system for winter sports
  - Infrastructure of artificial snow was established
  - Many smaller skiing resorts in lower elevations were pushed out of business

The Social System Problem Context

- Skiing and snow based tourism is <u>globally decreasing</u>
  - In recent two decades many more activities for amusement available
    - Revolution with regard to PC and PC games in 90ies
    - Mobile telephones in the last decade
  - Skiing is getting more expensive
    - Available income level in particular of young people decreased
    - It is no longer normal to learn skiing in traditional skiing countries like Austria

Case Study Austria

- Winter tourism in Austria increased
  - Austrians count for one third for overnights but are not so much a ski nation
    - 57% of Austrian never practice skiing!
    - 38% of Austrian occasionally practice skiing!
    - 5% ski regularly!
  - Two thirds of the winter tourists are foreigners
    - Booming economies e.g. in new EU countries or Russia compensated for otherwise declining numbers

Can the Dendrite Generator Help?

1. With regard to climate change?
2. With regard to better snow?
3. With regard to social system?
4. With regard to economic constraints?

Dendrite Generator (DG) and Climate Change (1)

- Mitigation of Climate Change
  - The DG causes less CO_2 than conventional methods of artificial snow production
    - Less energy
      - Use of renewable energy like solar is possible
    - Less water
      - Less pumping demand and related energy

DG and Climate Change (2)

- Adaptation of Climate Change
  - Second wave of climate change adaptation
    - A temperature of 0 C or below will be required
      - Eventually slightly higher temperatures might be possible due to special coatings of device
    - The „window“ in which snow production is possible
      - Is shrinking due to climate change
      - Can be widened again by the DG

DG and Better Snow

- Quality aspect of skiing
  - More fun due to fluffy snow (Pulverschnee)
    - A previous main point of critisicm can be avoided
  - Covering icy parts on ski slopes
    - To reduce and avoid accidents

DG and Social System

- Children in urban centers
  - Children have to play in snow again
  - Every school yard a dendrite generator
    - Even in case of a major warming the window for snow production will be present
  - Indoor variants for warmer season or climates
    - Take a shower in snow
    - Watch falling snow
    - In Southern Europe to generate more interest for skiing
  - Outdoor and indoor local spot variants
    - Will help to make ski areas again more popular

DG and Economy (1)

- Necessary adaptation in ski areas will become cheaper and economically more viable
  - The existing infrastructure can still be used for the DG
    - Even used after the current technology adaptation is no longer able.
  - Old system can be combined with DG
    - Previous investment is not in vain in case of stronger warming
    - The time scale of adaptation becomes longer

DG and Economy (2)

- New markets can open
  - Indoor equipment
  - Larger scale climate change adaptations
- Depends particularly
  - The price of device
  - The use of renewable energy systems

Road Map to the Market

- The expected market entry is 2013 or in 45 month
  - Depends on the support given to the project
  - Research projects and programs
- Phase 1
  - Laboratory Prototpype development
    - Start today, end February 2011
- Phase 2
  - Field experiments
    - 2011 to February 2013
- Phase 3
  - Production of first generation of (outdoor) devices
    - First half year of 2013

Thank you for your attention!

Danke für Ihre Aufmerksamkeit!